9278

Diag. Cht. No. 902

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey ..... HYDROGRAPHIC

Field No. MI-100-1-72

Office No. H-9278

LOCALITY

State ..... PUERTO RICO

General Locality ..... SOUTH COAST (OFFSHORE)

Locality ..... SOUTHEAST OF PONCE

1972

CHIEF OF PARTY
E. K. McCAFFREY

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DATE 3-7-77

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FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-9278

FIELD NO. MI-100-1-72

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State Puerto Rico

General locality South Coast (Offshore) ~~(Incomplete Survey)~~

Locality Southeast of Ponce ~~100 Fathom Curve to Lat. 17°10'N., Long. 66°09.9'W. to Long. 66°35.4'W.~~

Scale 1:100,000 Date of survey Apr. 4, 1972 - May 16, 1972

Instructions dated January 5, 1972 Project No. OPR-423-MI-72

Vessel NOAA Ship MT MITCHELL (MSS-22)

Chief of party Edwin K. McCaffrey, CAPT, NOAA, Commanding Officer

Surveyed by W.L. Adams J.L. Warner S.J. Wood C.W. Fisher J.G. Catlen Ship's Personnel (Alan J. Pickrell, ENS, Officer-in-Charge)

Soundings taken by echo sounder, ~~XXXXXXXXXX~~ echo sounder

Graphic record scaled by Ship's Personnel

Graphic record checked by PROCESSING DIVISION AMC

Protracted by CAL COMP 6/8 EDP-AMC Automated plot by CAL COMP 6/8 AMC-EDP

Soundings penciled by Verification by L. G. Crews

Soundings in fathoms ~~XXX~~ at MLW ~~XXXXX~~

REMARKS: HYDRO-PLOT System consisting of a Digital Corporation PDP-8/E Computer, Houston Instruments COMPLOT (Roll) Plotter. Ross Echo Sounder Recorder Model 5000, Transceiver Model 4000 and Digitizer Model 6000. McKiernan-Terry Precision Depth Recorder (PDR), Model XVa, used in conjunction with an EDO UQN, Model 185. An Alpine Depth Tracker (for digitizing PDR soundings) did not function properly and was not used. Applied to stds 8/22/77

USCOMM-DC 27009-P66

Descriptive Report

To Accompany

Hydrographic Survey MI-100-1-72

Registry Number H-9278

OPR-423-MI-72

South Coast of Puerto Rico

1972 Field Season

Scale 1:100,000

NOAA Ship MT MITCHELL (MSS-22)

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

A. PROJECT

This survey was accomplished as a part of Project OPR-423, South Coast, Puerto Rico, in accordance with project instructions dated January 5, 1972.

B. AREA SURVEYED

The survey was conducted off the south coast of Puerto Rico, southeast of Ponce. Work began on April 4, 1972 and was completed on May 16, 1972.

The east and west limits of the survey were longitudes 66°09.9'W. to 66°35.4'W. respectively, Latitude 17°10.0'N. on the south, and the 100 fathom curve, which is approximately 17°50.5'N. on the north. This survey is incomplete as per instructions, Paragraph 21: "Offshore hydrography shall be run out to the limit of adequate Hi-Fix control and need only be kept abreast of inshore work....." The limits of the complete boat sheet extend further to the east than the limits of hydrography.

H-9029

Soundings were junctioned with ~~prior~~ survey WH-100-1-69,

H-9029 on the west, and contemporary survey MI-20-1-72, H-9266 on the north. and 9595 to the east.

C. SOUNDING VESSEL

NOAA Ship MT MITCHELL was used to obtain all data for the survey. The HYDRO-PLOT system on board, consisting of a Digital Equipment Corporation PDP-8E Computer, HYDRO-PLOT Controller, and COMPLOT DP-3 Roll Plotter, was used to record and plot all positions and soundings.

D. SOUNDING EQUIPMENT

Smooth Sheet uses ½ fms to 101, and whole fms for over 101 fm. See Q C. Report

All soundings were recorded and plotted to the nearest whole fathom. Two echo sounders were used for the survey in accordance with project instructions, Paragraph 31. In depths less than 200 fathoms a Ross Echo Sounder, Model 5000, Serial Number 1052 was used. The transducer used is on the ship's skeg. At all depths, an EDO UQN Echo Sounder, Model 185, Serial Number 169 was used in conjunction with a McKiernan - Terry Precision Depth Recorder (PDR), Model Mark XVa, Serial Number 325. Comparisons were made between the two at common depths less than 200 fathoms and where they differed, the Ross soundings were plotted.

Two different transducers were used with the EDO Echo Sounder. Initially, a skeg transducer was used, but with this unit, the trace was usually lost when the depth became greater than 2100 fathoms. On April 5 it was discovered that the transducer mounted amidships would give a good trace at greater depths so this transducer was used with the EDO for the rest of the survey. This transducer is 29 meters forward of the skeg transducer used for the Ross and earlier EDO soundings. The displacement is not critical at the survey scale.

Comparison between the Ross and EDO over level bottom was good. Comparison soundings on the very steep slope off the Puerto Rican Shelf sometimes differed as much as 10 to 15 fathoms. This was due mainly to the fact that the Ross uses a narrow beam transducer whereas the EDO uses a broader beam, thus increasing the area for side echoes and recording shoaler depths on steep slopes. Near the edge of the shelf where it drops nearly straight off it can be seen that the distance between the two transducers also was a cause for a difference in a few comparison soundings, since the Ross depth is slightly less than the EDO when going over the edge from the in-

shore side.

Velocity corrections were determined from measurements obtained with a Nansen cast taken on April 20, 1972 at:

Latitude 17°26.6'N.
Longitude 66°24.5'W.

Settlement and squat correctors were obtained from data gathered on October 8, 1969 for standard speed (175 RPM, 10 feet pitch) and half speed (105 RPM, 10 feet pitch), for both skeg and amidships transducers. Linear interpolation between the two values was used to determine correctors for intermediate speeds.

A 2.3 fathom draft corrector was applied to the soundings plotted on line and appears in the corrector word of the Hyperbolic Master Tape. Several observations of the draft were taken during the survey and corrections for each day to the draft entered were determined by linear interpolation. These final corrections were included with settlement and squat correctors in the TRA corrector of the Electronic Corrector Tape.

Two vertical cast comparisons with the Ross Echo Sounder were made, in calm water, near the project area on May 17, 1972 and May 19, 1972. The information from these comparisons, taking into account velocity corrections, resulted in the determination of a 0.2 fathom instrument error. This correction is applied to all soundings taken from the Ross by means of the TC/TI Tape.

Tide corrections to be applied to all soundings will be obtained from data recorded by Fischer & Porter Portable ADR (punched tape) tide gages at Muelle de Ponce, Santa Isabel, and Arroyo (see Descriptive Tide Note included in this report). No predicted tide corrections have been applied to the soundings on the sheet due to very small tidal range in the area.

The Alpine Depth Tracker, for digitization of PDR soundings, was not functioning properly so soundings were read off the graphic record and entered manually through the HYDRO-PLOT Controller. The initial on the echo sounders was set at 0.0 and any drift was corrected in the scanning process.

The fathograms were scanned by trained personnel in accordance with the requirements specified in the Hydrographic Manual (Publication 20-2), and spot checked by the Officer in Charge. Insert soundings were added and erroneous soundings corrected by entering them on the Electronic Corrector Tape. The fathogram scanning is deemed adequate for this survey.

Abstracts of velocity corrections, draft corrections, and settlement and squat corrections are included in this report.

E. SMOOTH SHEET

The smooth sheet for this survey will be produced by the Atlantic Marine Center, Norfolk, Virginia. The following tapes, with respective printouts, were furnished to them for this purpose:

1. Hyperbolic Master Tape: produced on-line by the HYDRO-PLOT system. Data on these tapes consist of ship's draft (2.3 fathoms); Hi-Fix lane correctors used only for the on-line plot; raw soundings; and raw Hi-Fix lane readings for each sounding.

2. Electronic Corrector Tape: prepared on board. Data on these tapes include indicators defining the rotation of the plotted soundings; TRA correctors consisting of settlement and squat and corrections to the applied draft; final Hi-Fix correctors to be used for the off-line plot; corrections to misread soundings, and soundings to be inserted or omitted.

3. Velocity Corrector Tape: prepared on board from Nansen cast data.

4. TRA Correction/Table Indicator (TC/TI) Tape: prepared on board. This tape contains the instrument correction for the Ross echo sounder.

F. CONTROL

Hi-Fix, operating at a frequency of 1618.650 KHz, was used in the hyperbolic mode for position control during all sur-

vey work.

The Hi-Fix shore stations were:

ISABEL 1972 (Master Station)

Latitude 17°57'25.578"N.
Longitude 66°24'39.803"W.

HOMER 1972 (Slave 1 Station)

Latitude 17°57'53.152"N.
Longitude 66°36'58.297"W.

MAREAS 1972 (Slave 2 Station)

Latitude 17°55'55.632"N.
Longitude 66°09'29.483"W.

These stations were located by traverse and are third-order stations.

Hi-Fix was calibrated before commencing operations and after concluding operations, except for one medical emergency run in to port, at which time only the lane count was verified. When surveying during daylight hours, additional calibrations were made at convenient times. The Hi-Fix correctors were averaged from these calibrations to give final correctors which appear on the Electronic Corrector Tape for each day of operations. Several times while surveying at night, Hi-Fix went off the air and after it returned to operation usually only the lane count could be recovered due to the lack of sufficient identifiable lighted signals. In such cases, the correctors from the last calibration were used until the time of the breakdown, and those from the next good calibration used immediately after the breakdown.

All calibrations were made by three point fixes, with check angles. The Hi-Fix dials were read and recorded simultaneously. Hi-Fix values were then computed from the visual fix using the H/R Calibration Program (AM 56Ø). Comparing the observed Hi-Fix values with the computed Hi-Fix values yielded the correctors. The buoy circling method (using a Roberts current buoy) was also used for a lane count verification at night. A list of signals used for calibration

and an abstract of correctors for the off-line plot is included in this report.

At the offshore end of the sheet the angle of lane intersection is less than the recommended 30 degrees. This is reflected on the plot where several of the soundings are at slightly unequal spacing not accountable by changes in vessel speed. However, the bottom in that area is extremely flat, and as previously charted data is sparse or non-existent it is recommended that the soundings be retained as adequate to supersede prior surveys of that area.

G. SHORELINE

There is no shoreline within the limits of this survey.

H. CROSSLINES

Two crosslines were run in depths over 1000 fathoms amounting to 10.6% of the regular system of sounding lines (3200 meter spacing) at those depths. One crossline was run at depths less than 100 fathoms amounting to 4.5% of the regular system of sounding lines (800 meter spacing) at those depths. The latter is less than the recommended percentage, but a great deal of the area less than 1000 fathoms is on a very steep slope making crosslines impractical. Agreement between crosslines and the regular system of sounding lines was good.

I. JUNCTIONS ~~WITH PRIOR SURVEYS~~

9486 (MI-20-1-75) to the Northeast and H-9266 to the Northwest

Prior survey H-9029 (WH-100-1-69) junctions with this survey on the west. Some discrepancies were noted, although agreement was generally good. After application of velocity correction to soundings in the junction area, the contours between 200 - 1000 fathoms match quite well. See Ver. Report and O.C. Report.

The 100 fathom curve in the northwest corner disagrees somewhat with ~~the prior survey~~ H-9029. The differences are not remarkable and are most likely due to the recording of soundings on the upper portion of the slope with a narrow beam transducer.

In depths beyond 1000 fathoms some differences are apparent

and are probably a function of different velocity correctors used in the prior and present surveys. The differences are less than 1% of the depth and are most noticeable in the southern portion of the sheet where the bottom is extremely flat. The difference there is a constant 14 fathoms.

J. COMPARISON WITH PRIOR SURVEYS

Prior survey H-9237 (1905-06) covers a small portion on the northern end of this survey. Agreement is good.

K. COMPARISON WITH THE CHARTS

C&GS Charts 920 (18th edition) and 902 (10th edition) cover the area of this survey. Agreement with the charted soundings of both charts is generally from fair to poor with some differences of over 100 fathoms (after velocity corrections are applied) noted. For example, Chart 902 has 550 fathoms at Latitude 17°47'30"N. Longitude 66°28'00"W; the present survey, 718 fathoms. Chart 920 shows 2640 fathoms at Latitude 17°13'00"N. Longitude 66°35'00"W.; the present survey, 2775 fathoms.

One bottom formation, at Latitude 17°45'N. Longitude 66°11'W., called Escollo Investigator was developed beyond the regular system of sounding lines. A least depth of 166 fathoms was found. The least depth on both charts, in the area, is 194 fathoms. It is recommended that the 194 be deleted from the chart and be replaced with the 166 fathoms from the present survey.

L. ADEQUACY OF THE SURVEY

Within the limits of hydrography this survey is complete and adequate to supersede prior surveys for charting the area. No surveying was done east of Longitude 66°09.9'W.

M. AIDS TO NAVIGATION

None

N. STATISTICS

Linear Nautical Miles, Sounding Line	1043
Linear Nautical Miles, Crosslines	75
Linear Nautical Miles, Development	12
Total Linear Nautical Miles, Sounding Lines	1130
Square Nautical Miles (Area Covered)	992
Position Numbers Used (ØØØ1 to Ø656)	656
Position Numbers Rejected	28
Position Numbers Duplicated (Number Ø341)	1
Bottom Samples (3 Shipek, 1 Orange Peel)	4
Nansen Cast (21 Bottle Cast)	1

O. MISCELLANEOUS

All times used during this survey are Greenwich Mean Time.

A Hydrographic Operations Log book was used for recording remarks and supplementary data appropriate to the survey.

Using the HYDRO-PLOT system, all soundings except insert soundings are fixed positions. Insert soundings are plotted on time and course between two soundings.

The boatsheet and an overlay sheet containing crosslines, development, and bottom samples supplied to the Atlantic Marine Center are not corrected for tide or for velocity of sound in sea water. All positions do reflect Hi-Fix, draft, and settlement and squat corrections.

The main submarine feature is the edge of the Puerto Rican Shelf which extends across the northern portion of the survey. From a depth of approximately 20 fathoms it drops off very steeply to 1400 fathoms. In contrast, the bottom at the southern end is extremely flat at a depth of 2775 fathoms. The deepest sounding recorded is 2798 fathoms (with velocity correction applied).

Escollo Investigator, mentioned previously, is also an interesting feature. After the initial drop off the edge to about 550 fathoms, the bottom again rises steeply to 166

fathoms and then drops again to 1400 fathoms.

Four bottom samples were recorded in accordance with the Hydrographic Manual. Four attempts were made at one position and two at a second to get a sample. The sampler operated properly each time and came up with nothing. These two stations were described as "hard bottom". The two samples obtained at the remaining sites were logged and forwarded to: Dr. J. W. Pierce, Department of Sedimentology, Smithsonian Institute, Washington, D.C. in accordance with standing instructions. C&GS Form 733 M "Log Sheet M" was completed and a copy forwarded with the samples. A completed form is included in this report.

P. RECOMMENDATIONS

None

Q. REFERENCE TO REPORTS

The 1972 Field Season reports, listed below, should be referred to for a complete evaluation of this survey.

Report on Calibration of Hi-Fix
Report on Corrections to Echo Soundings
Descriptive Report, MT MITCHELL, MI-20-1-72 (H-9266)

Respectfully Submitted:

Alan J. Pickrell

Alan J. Pickrell
ENS, NOAA

Approved and Forwarded:

Edwin K. McCaffrey

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

Approval Sheet

Field Number MI-100-1-72

Registry Number H-9278

The field work and processing of data from this hydrographic survey was under my immediate daily supervision. The boat sheet and all records have been reviewed and are approved by me.

This survey is complete, within the limits of the hydrography, and adequate to supersede all prior surveys of the area.

Edwin K. McCaffrey
CAPT, NOAA
Commanding Officer

18 00 00
17 05 00

65 55 00
66 40 00

List of Signals used for Calibration
on MI-100-1-72
Puerto Rico (South Coast) 1972

Signal Number	N- Latitude Deg-Min-Sec	W- Longitude Deg-Min-Sec	Located by (Method)	Temporary or Recoverable	Traverse control number or Other Name, Year Located
100	18-00-22.74	066-36-52.28	Intersection	Recov.	Microwave Antenna, Ponce, 1972
105	18-01-25.44	066-37-15.87	Intersection	Recov.	WRIK TV Tower, Ponce Intercont. Hotel
110	17-59-57.43	066-36-54.70	Intersection	Recov.	Ponce Mills Water Tank
120	17-57-50.48	066-34-44.69	Traverse	Temp.	Wirshing Eccentric, 1971
125	18-01-14.16	066-33-53.18	Intersection	Recov.	Don Q South Stack
130	17-59-53.13	066-32-25.26	Intersection	Recov.	Central Fortuna Stack, 1972
140	18-00-32.88	066-30-17.74	Intersection	Recov.	Fort Allen Water Tank, 1966
150	17-59-34.99	066-28-31.77	Intersection	Recov.	WCGB Radio Tower, 1972
160	17-59-50.12	066-26-01.35	Intersection	Recov.	Cortada Sugar Company Stack
170	17-58-23.22	066-24-16.32	Intersection	Recov.	Santa Isabelle E. Municipal Water Tank
175	17-58-38.85	066-18-14.01	Intersection	Recov.	Salinas Radio Tower, WHOY, 1972
177	17-58-50.63	066-17-45.57	Intersection	Recov.	Salinas Water Tank, 1972
180	17-56-08-75	066-16-59.68	Intersection	Recov.	Bahia De Jobos Light, 45 Feet
190	17-57-18.14	066-13-21.22	Intersection	Recov.	Central Aguire Stack, Tallest of two
200	17-53-42.52	066-31-17.60	Intersection	Recov.	Muertos Island Lighthouse, 1899
280	17-53-10.26	066-31-43.66	3 Point Fix	Recov.	Janet, 1970
460	17-57-31.37	066-38-07.49	Intersection	Recov.	Cardona Island Lighthouse
532	17-55-32.68	066-27-12.37	3 Point Fix	Recov.	Claire, 1970
536	17-55-23.97	066-27-24.97	Traverse	Temp.	C-01, 1972
600	17-57-53.00	066-25-53.90	Traverse	Temp.	Cayito 2, 1972
612	17-57-36.92	066-24-53.13	Traverse	Temp.	CJ-03, 1972
624	17-57-09.01	066-24-12.52	Traverse	Temp.	CJ-06, 1972

VELOCITY TABLE 22

CORRECTION	TO DEPTH	CORRECTION	TO DEPTH
+ 0.0	12.0	52.0	1842.0
1.0	35.9	54.0	1888.0
2.0	60.0	56.0	1930.0
3.0	83.9	58.0	1970.0
4.0	117.8	60.0	2014.0
5.0	134.5	62.0	2055.0
6.0	161.4	64.0	2095.0
7.0	189.2	66.0	2132.0
8.0	223.0	68.0	2170.0
9.0	262.0	70.0	2208.0
10.0	330.0	72.0	2243.0
12.0	436.0	74.0	2280.0
14.0	546.0	76.0	2315.0
16.0	661.0	78.0	2350.0
18.0	788.0	80.0	2382.0
20.0	888.0	82.0	2420.0
22.0	975.0	84.0	2451.0
24.0	1053.0	86.0	2483.0
26.0	1127.0	88.0	2513.0
28.0	1195.0	90.0	2542.0
30.0	1261.0	92.0	2571.0
32.0	1322.0	94.0	2603.0
34.0	1385.0	96.0	2633.0
36.0	1443.0	98.0	2665.0
38.0	1500.0	100.0	2697.0
40.0	1552.0	102.0	2725.0
42.0	1604.0	104.0	2759.0
44.0	1658.0	106.0	2784.0
46.0	1703.0	108.0	2813.0
48.0	1750.0	110.0	2841.0
50.0	1798.0	112.0	2870.0

Abstract of Vertical Cast Data

NOAA Ship MT MITCHELL (MSS-22)

May 17, 1972

Ross Depth Recorder (Model 5000 - Serial Number 1052) with initial set at 0.0. Ship's draft (aft) = 13.8' (using skeg transducer). Velocity correction for 60 feet = +1.8 feet. Ship anchored west of Berberia Island, Puerto Rico

Leadline Measurement - 10'= 9.95', 20'=19.85', 30'=29.70'
(Handlead #1) 40'=39.60', 50'=49.50', 60'=59.40'

All values listed below are in feet and tenths of feet

H.L. Depth	H.L. Corr.	True Depth	Echo Depth	Draft	Vel. Corr.	Corr. Echo Depth	Difference True vs Echo
61.5	-0.6	60.9	44.3	+13.8	+1.8	59.9	1.0
61.0	-0.6	60.4	44.1	+13.8	+1.8	59.7	0.7
61.0	-0.6	60.4	44.5	+13.8	+1.8	60.1	0.3 R
60.9	-0.6	60.3	44.3	+13.8	+1.8	59.9	0.4 R
61.5	-0.6	60.9	44.2	+13.8	+1.8	59.8	1.1
61.5	-0.6	60.9	44.4	+13.8	+1.8	60.0	0.9
61.5	-0.6	60.9	44.3	+13.8	+1.8	59.9	1.0
61.5	-0.6	60.9	44.5	+13.8	+1.8	60.1	0.8
61.0	-0.6	60.4	44.5	+13.8	+1.8	60.1	0.3 R
61.5	-0.6	60.9	44.4	+13.8	+1.8	60.0	0.9

Mean of 7 Differences = 0.92

Instrument Correction = + 0.9 feet

TRA Correction Abstract

Boatsheet MI-100-1-72 H-9278 NOAA Ship MT MITCHELL (MSS-22)

Jul Day	Time (GMT) From	To	Transducer	Draft Entered	True Draft	Draft Corr.	Settlement&Squat 1 Engine	2 Engine	TRA Corrector Feet	Fathoms
Ø95	131201	235959	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
Ø96	000000	110600	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
Ø96	113700	135700	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
Ø96	135800	144100	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
Ø96	144200	232000	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
Ø97	002901	060101	Amidships	+13.8	+12.7	-1.1		+1.4	+0.3	0.0
Ø97	071900	091631	Amidships	+13.8	+12.7	-1.1	+1.0		-0.1	0.0
Ø97	091801	092401	Amidships	+13.8	+12.7	-1.1		+1.1	0.0	0.0
Ø97	092500	103600	Amidships	+13.8	+12.7	-1.1		+1.4	+0.3	0.0
Ø97	121601	121801	Amidships	+13.8	+12.7	-1.1	+1.0		-0.1	0.0
Ø97	121901	133901	Amidships	+13.8	+12.7	-1.1		+1.4	+0.3	0.0
1Ø1	203100	203200	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø1	203300	235900	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	000000	035401	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	035501	040901	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø2	041001	054000	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	054100	055300	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø2	055400	072901	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	073001	074601	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø2	074701	090500	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	090600	091501	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø2	091601	104209	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
1Ø2	104309	104609	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
1Ø2	203351	203821	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
1Ø2	203951	225321	Amidships	+13.8	+12.9	-0.9	+1.0		+0.1	0.0
1Ø3	023530	023915	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
1Ø3	024000	050201	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
1Ø3	050331	051600	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
1Ø3	051730	074600	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
1Ø3	074730	080000	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
1Ø3	080130	103300	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
1Ø3	103430	104030	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1

TRA Correction Abstract

Boatsheet MI-100-1-72 H-9278 NOAA Ship MT MITCHELL (MSS-22)

Jul Day	Time (GMT) From	To	Transducer	Draft Entered	True Draft	Draft Corr.	Settlement&Squat 1 Engine	2 Engine	TRA Corrector Feet	Fathoms
103	201530	201930	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
103	202000	221830	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
103	222000	224100	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
103	224230	225300	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	004430	022430	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	022600	022900	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	024600	042430	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	042600	044530	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	044700	063500	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	063630	064530	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	064700	084830	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	085000	085300	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	190200	190800	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	190930	204100	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	204230	210730	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	210900	225130	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
104	225300	231030	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
104	231200	235700	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	000800	004700	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	015600	020200	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
105	020330	023000	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	023130	025331	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
105	025501	042700	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	042830	045030	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
105	045200	063330	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	063500	064930	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
105	065100	083430	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	083600	085500	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
105	085630	103930	Amidships	+13.8	+12.8	-1.0	+1.0		0.0	0.0
105	104100	105900	Skeg	+13.8	+13.0	-0.8	+0.4		-0.4	-0.1
108	210400	210800	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
108	210900	225200	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1

TRA Correction Abstract

Boatsheet MI-100-1-72 H-9278 NOAA Ship MT MITCHELL (MSS-22)

Jul Day	Time (GMT) From	To	Transducer	Draft Entered	True Draft	Draft Corr.	Settlement&Squat 1 Engine	2 Engine	TRA Corrector Feet	Fathoms
109	053601	053731	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	053801	072901	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
109	073001	074200	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	074300	090800	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
109	090900	091400	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	091500	093300	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
109	093400	093700	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	195800	200200	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	200300	202300	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
109	202400	202600	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
109	202700	235900	Amidships	+13.8	+12.9	-0.9		+1.4	+0.5	+0.1
110	000000	032500	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	032600	034400	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	034500	051500	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	051600	051800	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	051900	053900	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	054000	054300	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	061800	061900	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	062000	062700	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	062800	204000	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	204100	------	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	204200	210300	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
110	210400	210700	Skeg	+13.8	+13.0	-0.8		+0.8	0.0	0.0
110	210800	212800	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
111	024959	171029	Amidships	+13.8	+12.8	-1.0		+1.4	+0.4	+0.1
137	125000	134000	Amidships	+13.8	+13.0	-0.8		0.0	-0.8	-0.1

Settlement and Squat Abstract

NOAA Ship MT MITCHELL (MSS-22)

Excerpt from Commanding Officer, MT MITCHELL memorandum dated October 29, 1969, "Skeg Transducer Performance".

Another item of interest was the settlement and squat determination. This was run in 52 feet of water, calm with only a slight swell and the data is well within the limits of ½ foot accuracy. We had a full load of fuel and the draft was 13.8 feet stern, 14.0 feet midships at dockside just before the determination.

Results were:

	Standard Speed 175 RPM	Half Speed 105 RPM
Skeg Transducer	0.8 feet	0.1 feet
Mid-ships Transducer	1.4 feet	0.6 feet

This bears out the past eyeball observations that the MT MITCHELL goes down by the bow considerably when underway. Fuel is always used from the forward tanks first to combat this situation.

Linear Interpolation Graph Abstract

Mid-ships Transducer

RPM	Correction	RPM	Correction	RPM	Correction
105	+0.6	130	+0.9	155	+1.2
110	+0.6	135	+0.9	160	+1.2
115	+0.7	140	+1.0	165	+1.3
120	+0.8	145	+1.1	170	+1.3
125	+0.8	150	+1.1	175	+1.4

Skeg Transducer

105	+0.1	130	+0.3	155	+0.6
110	+0.1	135	+0.4	160	+0.6
115	+0.2	140	+0.4	165	+0.7
120	+0.2	145	+0.5	170	+0.7
125	+0.3	150	+0.5	175	+0.8

Boatsheet MI-100-1-72

H-9278

Abstract of Hi-Fix Lane Correctors

NOAA Ship MT MITCHELL (MSS-22)

Julian Day	Time (GMT) From	To	P1 Corr.	P2 Corr.
Ø95	1312Ø1	235959	-Ø.32	+Ø.23
Ø96	ØØØØØØ	ØØ16ØØ	-Ø.32	+Ø.23
	Ø334ØØ	232ØØØ	-Ø.17	-Ø.91
Ø97	ØØ29Ø1	1339Ø1	-Ø.17	-Ø.91
1Ø1	2Ø31ØØ	235959	-Ø.34	+Ø.16
1Ø2	ØØØØØØ	1Ø46Ø9	-Ø.34	+Ø.16
	2Ø3351	225321	-Ø.27	+Ø.Ø3
1Ø3	Ø2353Ø	1Ø4Ø3Ø	-Ø.33	Ø.ØØ
	2Ø153Ø	2253ØØ	-Ø.23	+Ø.16
1Ø4	ØØ443Ø	Ø853ØØ	-Ø.16	+Ø.28
	19Ø2ØØ	2357ØØ	-Ø.18	+Ø.26
1Ø5	ØØØ8ØØ	ØØ47ØØ	-Ø.18	+Ø.26
	Ø156ØØ	1Ø59ØØ	-Ø.26	+Ø.16
1Ø8	21Ø4ØØ	2252ØØ	-Ø.26	+Ø.34
1Ø9	Ø536Ø1	Ø937ØØ	-Ø.27	+Ø.23
	1958ØØ	2359ØØ	-Ø.25	+Ø.25
11Ø	ØØØØØØ	Ø8Ø9ØØ	-Ø.25	+Ø.25
	2Ø12ØØ	2128ØØ	-Ø.36	+Ø.21
111	Ø24959	171Ø29	-Ø.3Ø	+Ø.22
137	125ØØØ	143ØØØ	Ø.ØØ	Ø.ØØ

1/31/75

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): Muelle dePonce Arroyo

Period: April 4 - May 16, 1972

HYDROGRAPHIC SHEET: H9278

OPR: 423

Locality: South Coast of Puerto Rico

Plane of reference (mean ~~low~~ low water): 3.4 ft. (Muelle dePonce
3.1 ft. (Arroyo)

Height of Mean High Water above Plane of Reference is 0.7 ft.

Remarks: Recommended automated zoning.

James R Hubbard
for Chief, Tides Branch

(14)

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SURVEY NUMBER

H-9278

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CARIBBEAN SEA										1
ESCOLLO INVESTIGATOR										2
ISLA CAJA DE MUERTOS										3
PONCE (TITLE)										4
PUERTO RICO (TITLE)										5
PUNTA CABULLÓNES										6
PUNTA FIGURAS										7
PUNTA OLA GRANDE										8
PUNTA PETRONA										9
										10
										11
										12
										13
										14
						APPROVED				15
						Chas. E. Harrington				16
						STAFF GEOGRAPHER			C51x2	17
						1 APRIL 1977				18
										19
										20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

☆ U.S. G.P.O. 1972-769-565/516 REG. #6

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H-9278

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.

Date: 2-10-77

Signed: William L Jones

Title: Chief, Verification Branch

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: 2-9-77

Signed: R. A. Trumbo

Title: Chief, Processing Division

NOAA FORM 77-27
(9-72)
(PRESC. BY HYDROGRAPHIC MANUAL 20-2, 6-94, 7-13)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. H-9278

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET with smooth PNO & excess overlay	1	BOAT SHEETS (2/4 parts, mylar)	1
DESCRIPTIVE REPORT	1	OVERLAYS preliminary	4 XX

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	13		1			
CAHIERS			1			
VOLUMES						1-Op. log
BOXES						

T-SHEET PRINTS *(List)*

SPECIAL REPORTS *(List)*

OFFICE PROCESSING ACTIVITIES
The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				631
POSITIONS CHECKED		63		
POSITIONS REVISED		5		
DEPTH SOUNDINGS REVISED		56		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		0		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		--		
JUNCTIONS		8		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		16		
SPECIAL ADJUSTMENTS		0		
ALL OTHER WORK		82		
TOTALS		106		

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY W.H. Tyndall	10/17/74	02/19/75
VERIFICATION BY ~~R~~L.G. Cram	06/23/75	01/07/77
REVIEW BY L.G. Cram	01/07/77	01/17/77

Carstens 6 hrs 3/11/77 Baumgardner 5 hrs 3/22/77

Q.C. Insp. R.W. DerKazarian 44 hrs. 4/13/77

★ U.S. G.P.O. 1972-769-562/439 REG. #6

Reg. No. H-9278

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE_____ TIME REQ'D_____ INITIALS_____

REMARKS: pos

002908	032800
002909	032901
003000	043800
009901	043802
009902	047200
031004	048403

Reg. No. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE_____ TIME REQ'D._____ INITIALS_____

REMARKS:

Information for Future Presurvey Reviews

The bottom has basically remained unchanged since the prior surveys and no significant changes should be expected.

Position Index		Bottom Change	Use	Resurvey
Lat.	Long.	Index	Index	Cycle
175	662	2	1	50 years
175	663	2	1	50 years
175	664	2	2	50 years
174	662	1	1	50 years
174	663	1	1	50 years

The remainder of the area contains depths all greater than 20 fathoms and the resurvey cycle is 50 years.

ATLANTIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9278 FIELD NO. MI-100-1-72

South Coast of Puerto Rico (Offshore)

SURVEYED: April 4, 1972 through May 16, 1972

SCALE: 1:100,000 PROJECT NO.: OPR-423

SOUNDINGS: Ross Echo Sounder and McKierman-Terry Precision Depth Recorder CONTROL: HI-FIX (Hyperbolic)

Chief of Party ..... E.K. McCaffrey
Surveyed by ..... A.S. Pickrell
Automated Plot by ..... Calcomp-618 (AMC)
Verified and Inked by ..... L.G. Cram

1. Introduction

a. No unusual problems were encountered during verification.

b. In Item 7, page 1, "Comparison with Charts", the field used C&GS Chart 920 (18th Edition) and C&GS Chart 902 (10th Edition). Insofar as these editions were not available during verification, the 23rd Edition of C&GS 920 (25640) and the 12th Edition of C&GS 902 were used.

c. The projection parameters were changed during verification. The tides were changed, as the field used predicted tides and verification was done with smooth tides zoned from gages at Arroyo, Muelle de Ponce, and Santa Isabel.

2. Control and Shoreline

a. The source of control is adequately described in Section F of the Descriptive Report.

b. The shoreline was taken from Chart 902, 12th Edition, April 6, 1974 and applied in brown on the Smooth Sheet to show relative positions of horizontal and tidal control.

3. Hydrography

a. The agreement of soundings at crosslines is good for this survey.

b. The depth curves are adequate to delineate the features and the bottom configuration on this survey. It is noted that the 2000 fathom curve has an irregular area at approximately latitude 17° 27', longitude 66° 28'. While this feature may well exist, there is not sufficient hydrography in the area to be sure that it exists. About one mile north of these lines is a cross-line (positions 612 to 613) that agrees with all three lines and has a 1047 fathom sounding, which shows that the deep does extend northward in this area. Recommend running more hydrography in this location at some future date.

The 30, 40 and 50 fathom contours ~~was~~ were left off, as the soundings are too closely spaced in this area.

c. There was only one development run on this survey; it was on a feature called "Escollo Investigater", located at approximately latitude 17° 45', longitude 66° 10' 30". The least depth found was a 166 fathom sounding in an area of 167 fathoms charted depth. This development was adequate to determine the least depth on this feature. There is a deep area that runs almost the total width of the sheet from east to west. It is from 31 fathoms to 21 fathoms deep and lies within the 20 fathom curve. No apparent attempt was made to delineate this bottom feature.

4. Condition of Survey

a. There was no statement in the Descriptive Report concerning Presurvey Review.

b. ~~No~~ An adequate junction was made with H-9029 (WH-100-1-69).

5. Junctions See Para. 4 of the O.C. Report

Junctions were effected with the following surveys:

H-9595 (1976) 1:100,000 to the ~~west~~ east
H-9486 (1975) 1:20,000 to the north~~west~~ east corner
H-9266 (1972) 1:20,000 to the north~~east~~ west
H-9029 (1969) 1:100,000 to the west

The junction agreement with H-9595 is good. In some areas, the north~~west~~ east corner - where the bottom drops away very rapidly in particular, the soundings are different. The junctional

curves could be completed with no trouble.

The junction with H-9486 was made with some difficulty. The main problems stem from the extreme difference in scale between the two surveys. (H-9486 is 1:20,000 and H-9278 is 1:100,000.) Another problem was encountered due to the fact that the junction was in an area of extreme bottom ~~change~~ gradients. The bottom drops very rapidly in this area. For charting purposes it is proposed that the 20 fathom contour be charted from H-9486.

H-9266 - The agreement was as good as could be expected when junctioning surveys with a scale difference of 1:5. Survey H-9266 is 1:20,000 and H-9278 is 1:100,000. The junction is in an area of a sharp drop in the bottom. The 20 fathom curve (120 feet) should be charted from H-9266.

The junction with H-9029 was made with poor agreement. A paper ozalid copy of the Smooth Sheet H-9029 was used for junctioning. As the junction is on the extreme edge of the ozalid copy, the distortion in scale is greatest in the junctioning area. As stated in the Descriptive Report; Paragraph I, page 6, there is a 14 fathom difference in depths at the southern edge of the junctioning area, and the problem could be in the velocity correctors. After researching the available material the velocity correctors for this sheet appear to be correct and were used; the velocity correctors for H-9029 were not available during verification. The difference does not exceed 1% of the total depth in this area; recommend using the curves from the present survey in this area.

6. Comparison with Prior Surveys See Para 5 of the O.C. Report

H-2805 (1906) 1:100,000
H-2806 (1906) 1:100,000
H-2424 (1899) 1:20,000
H-2737 (1905-06) 1:40,000
H-2736 (1905-06) 1:40,000

The present survey is three to eight fathoms shoaler than the two 1:100,000 prior surveys (H-2805 and H-2806). The difference can be attributed to at least two main causes: A natural building up of the bottom and the distance off-shore, where the limits of the control and sounding equipment might have been stretched a bit. Also there was no datum adjustment ticks on either prior survey, they did have

the triangulation station, Muertos Island Lighthouse, 1899, plotted and the location was compared with the location on the present survey with excellent agreement.

The comparison with H-2424, H-2737, and H-2736 could only be completed with some difficulty. The differences in scale between these surveys and the present survey were on the order of 1:5 and 1:2.5. There was the added factor of comparing a survey done in feet to one done in fathoms. The agreement ranges from two feet to 12 feet, with the present survey being shoaler for the most part. This difference can be attributed to natural causes and to the more modern methods in use today. Consideration was given to the fact that these surveys are in the area of the Continental Slope, where the depth changes very rapidly.

The present survey is considered adequate to supersede the prior surveys, supplemented with information from the junctional surveys on the northern portion of the survey.

7. Comparison with Chart C&GS 902, 12th Edition, April 6, 1974 and C&GS 920 (25640), 23rd Edition, December 13, 1975

Approximately 95% of the charted information was from prior surveys and is covered by that section of this report. The remaining items not verified or disproved are discussed below:

a. A 1542 fathom sounding at approximately latitude 17° 40' 54", longitude 66° 23' 42". No source was found for this sounding, nor were any sounding lines run over it. However, the line on one side has a 1210 fathom sounding and the line on the other side has a 1334 fathom sounding. Recommend deleting this sounding from the chart after due consideration by headquarters. Delete

b. The following Presurvey Review Items are in the survey area. The field did not run any developments over these items, nor was any discussion written in the Descriptive Report. These are listed below with least depths from this survey:

Charted Depth	Approx. Latitude	Approx. Longitude	Least Depth
11fms	17° 49.7'	66° 25.2'	11' ~~12.5~~fms
13fms	17° 49.9'	66° 24.9'	11.5fms

Charted Depth	Approx. Latitude	Approx. Longitude	Least Depth
11fms	17° 50.1	66° 23.5'	18.5fms (retain charted depth)
12 & 13fms	17° 50.2	66° 21.7'	13.5fms and 14.5fms
15fms	17° 49.3'	66° 19.8'	16.5fms (retain charted depths)
14fms	17° 49.8'	66° 19.0'	12.3fms
11fms	17° 50.3'	66° 17.7'	14.5fms (retain charted depth)
16fms	17° 50.4'	66° 17.2'	18.5fms*

16, 15, 17, 16, and 13fms - approximate latitude 17° 50.0', longitude 66° 13.0'; 16.5 to 13.5fm sounding exist on present survey.

17fms - approximate latitude 17° 50.0', longitude 66° 11.2'; 12.5fms from present survey.

* 0.2 miles north on present survey

These items were not developed by the field on this survey; however, it is believed that some of them were investigated on the two 1:20,000 surveys, H-9266 (1972) and H-9486 (1975). The field should have made some mention as to how these items were disposed of.

The present survey is adequate to supersede the charted information, in the common area.

8. Compliance with Instructions

This survey adequately complies with the Project Instructions with the following exceptions:

a. The lack of any mention of Presurvey Review Items.

b. The Project Instructions, Paragraph 3, page 1, "Junctions" states that a junction will be made with the NOAA Ship WHITING's work of 1969. The WHITING sheet H-9029 (WH-100-1-69) was not adequately junctioned with, instead a note to the effect that a 14 fathom difference exists was put in the Descriptive Report. See O.C. Report, para 4.

9. Additional Field Work

This survey is an adequate basic survey. Additional field work is not recommended.

SURVEY H-9278

Examined and Approved:
Hydrographic Inspection Team
Date: Feb.9,1977

CDR Robert A. Trauschke, NOAA
Chief, Processing Division

CDR Jeffrey G. Carlen, NOAA
Chief, Coastal Mapping Division

D. Douglas Mason, LT, NOAA
Chief, EDP Branch

William L. Jonns
Chief, Verification Branch

Guy F. Trefethen
Verification Branch

Approved/ Forwarded

Robert C. Munson
RADM, NOAA
Director, Atlantic Marine Center

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352

April 13, 1977

TO: A. J. Patrick
Chief, Marine Surveys Division

THRU: Chief, Quality Control Branch

FROM: Robert W. DerKazarian
Quality Evaluator

SUBJECT: Quality Control Report for H-9278 (1972), Southeast of Ponce, South Coast (Offshore), Puerto Rico

Survey H-9278 was inspected to evaluate the accuracy and adequacy of the survey with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, decisions and actions taken by the verifier, and the cartographic presentation of data. In general, it was found to conform to the National Ocean Survey's standards and requirements except as follows:

1. The smooth sheet is plotted in 0.5-fathom increments to 30 fathoms and whole fathoms thereafter; the printout is shown in fathom and tenths to 30 fathoms. Soundings carried forward from prior surveys and soundings transferred in junctioning are shown in fathoms and tenths.

2. A note was added to the smooth sheet stating the source of the brown high water line shown.

3. The "Hydrographic Title Sheet" did not include the list of officers conducting the survey.

4. An adequate junction was effected with H-9029 (1969) at the time of the quality evaluation. Depths of 2,700 fathoms and greater on the present survey in the junctional area are 14 fathoms deeper than those on H-9029. This disagreement can be attributed to a 14-fathom difference in velocity correctors in deep areas. The discrepancy as recognized in the Descriptive Report, paragraph I, and the Verifier's Report, paragraph 5, is only about 0.5 percent of the depth and does not compromise the accuracy of these surveys.

The junction with H-9266 (1972) was greatly revised during the quality evaluation. Noting the difference in scale of these surveys, greater latitude in drawing the curves may be accepted, but the curves should conform in shape and not be generalized to such an extent as to not define a feature. Several shoal soundings have been transferred to the present survey and several soundings on the present survey have been rescanned in effecting this junction; one change exceeded 88 fathoms in the slope area. A 20-fathom curve in the vicinity of latitude 17°49.6', longitude 66°25.0' that delineates a portion of a ridge has not been shown on the present smooth sheet for the sake of clarity. Refer to H-9266 for this delineation.

Junctional surveys H-9486 (1975) and H-9595 (1976) have not been received at Headquarters. The junction of these surveys will be considered in the quality evaluation of those surveys.

5. This information should be noted under the "Comparison with Prior Surveys."

Surveys H-2424 (1899), H-2805 and H-2806 of 1906 are of a reconnaissance type; the sparse soundings provide only general information of this area. Several bottom characteristics from these surveys have been carried forward to the present survey.

Surveys H-2736 and H-2737 of 1905-06 cover the northernmost portion of the present survey and are discussed in the Verifier's Report. It should be noted that several soundings have been carried forward from H-2737 as well as bottom characteristics from both surveys.

With the additions of the items carried forward, the present survey is adequate to supersede these prior surveys in the common area.

6. This information should be noted under the "Comparison with Charts."

The origin of the remaining charted soundings which were not identified in the Verifier's Report is British Admiralty surveys which are adequately superseded by the present survey.

Attention is directed to the 550-fathom sounding addressed in the Descriptive Report, paragraph K. This sounding as with several other shoaler soundings in deeper depths in the vicinity of latitude 17°48.00', longitude 66°13.00' charted from miscellaneous sources are considered questionable and should be deleted from the chart.

7. The Hydrographic Inspection Team did not submit a report of their findings of the present survey or enter their time on the "Hydrographic Statistics" sheet.

cc:
C351

REGISTRY NO. 9278

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

REGISTRY NO. 9278

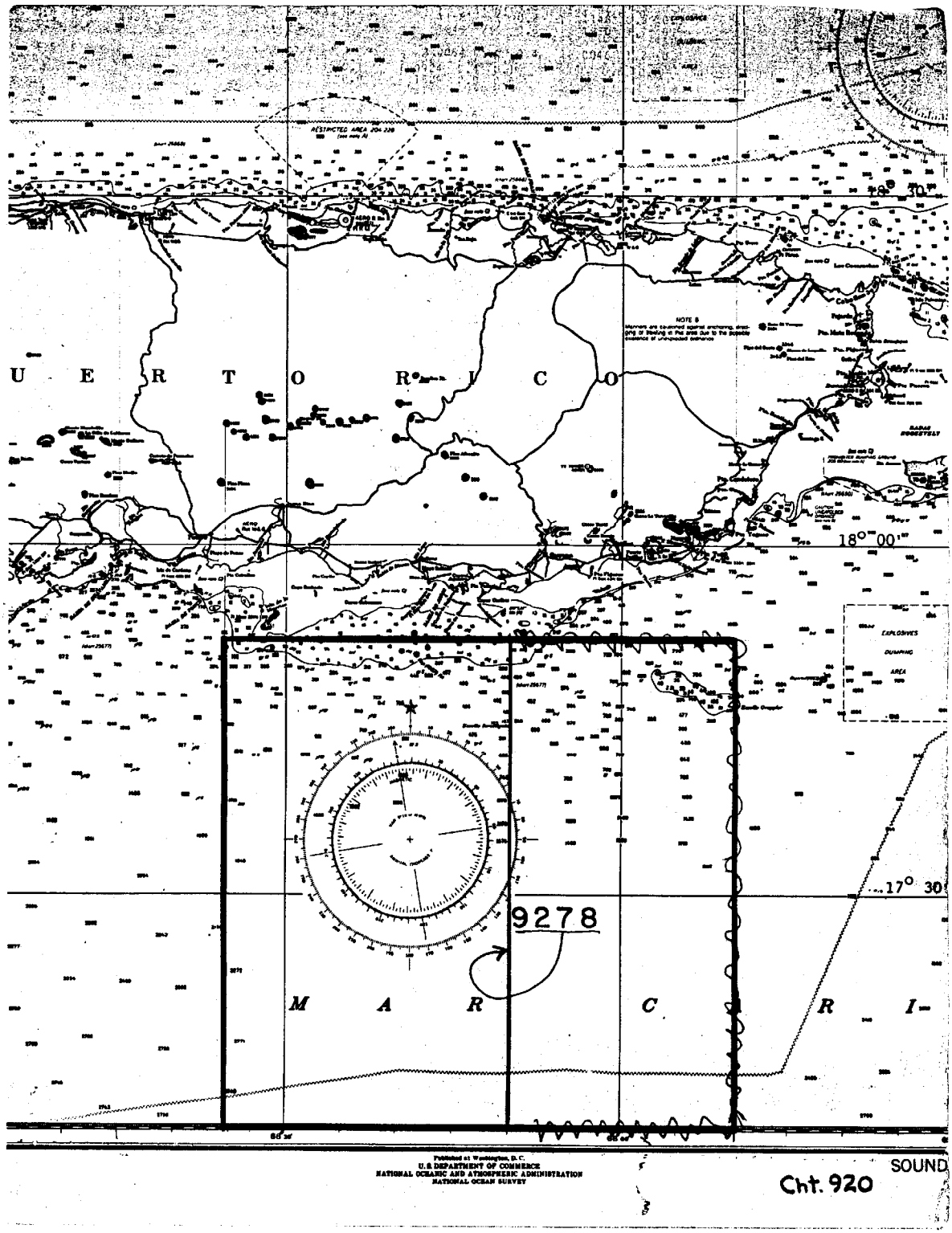
The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE 1-8-82 TIME REQUIRED _____ INITIALS JHC

REMARKS: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Published at Washington, D. C.
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY
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FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9278

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
25683	9-26-78	J. Briggs	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(927)			Drawing No. Fully applied (QC inspection)
25677	1-9-81	B. Fernandez	Full ~~Part~~ Before After Verification Review Quality Control Inspection Signed Via
902			Drawing No.
25640	6-28-82	R. Richter	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(920)			Drawing No. Quality Control
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63